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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,462	05/07/2004	Hou-Wei Lin	REAP0033USA	3461

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EXAMINER	
PEREZ, JAMES M	
ART UNIT	**PAPER NUMBER**
2609	

NOTIFICATION DATE	DELIVERY MODE
05/25/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/709,462	LIN ET AL.	
	Examiner	Art Unit	
	James Perez	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 11* is/are rejected.

7)☒ Claim(s) *7-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *07 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/07/04 and 5/17/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones USPN 6873279 in view of Jayaraman USPN 7046726.

4. **As per claim 1**, Jones teaches a passband (Jones fig. 1: signal from the channel is a passband signal since it is a signal passing through the channel and the channel obviously has a band) adaptive equalizer (Jones fig. 1: 112 being adapted by bottom input) for generating the equalized signal (Jones fig. 1: output of 112) according to the passband signal (Jones fig. 1: output of 112 is according to input into 104), comprising a feed-forward equalizer (FFE) and a feedback equalizer (FBE) (Jones fig. 1: 112; col. 6 lines 4-7: teaches FFE or FBE but not FFE and FBE but it would have been obvious as explained below); and a multilevel quantizer coupled with the passband adaptive equalizer (Jones fig. 1: 116 coupled with 112) for selectively utilizing a single predetermined threshold or a plurality of multiple predetermined thresholds (Jones fig. 3a: selecting to quantize between various thresholds Min0, Min1, Max0, Max1; col. 7 line 39 to col. 8 line 39) to quantize the equalized signal in order to generate a sliced signal (Jones fig. 1: output of 116).

Jones does not teach FFE and FBE. Jayaraman teaches FFE and FBE. Therefore, it would have been to one of ordinary skill in the art at the time of the invention to modify Jones with the teaching of Jayaraman since Jones teaches FFE or FBE and Jayaraman teaches the beneficial use of FFE and FBE (Jayarama fig. 2: 306, 310) such as to reduce linear distortion over a variety of operating conditions (Jayarama col. 1 line 55-60) in the analogous art of equalization.

5. **As per claim 2,** Jones in view of Jayaraman teaches the limitations as discussed above. Jones in view of Jayaraman also teaches the passband (Jones fig. 1: signal from the channel is a passband signal since it is a signal passing through the channel and the channel inherently has a band) adaptive equalizer (Jones fig. 1: 112 being adapted by bottom input) comprises an adder coupled respectively with the FFE and the FBE (Jones fig. 1: 112; col. 6 lines 4-7) (Jayarama fig. 2: 306, 310) for outputting the equalized signal according to signals outputted from the FFE and the FBE. Therefore it would have been obvious to one of ordinary skill at the time of the invention to modify Jones with the teaching of Jayaraman such as to reduce linear distortion over a variety of operating conditions (Jayarama col. 1 line 55-60) in the analogous art of equalization.

6. **As per claim 5,** Jones in view of Jayaraman teaches the limitations as discussed above. Jones in view of Jayaraman also teaches a control logic (Jones ABSTRACT: "a slicer receives one or more updated threshold values during operation to adaptively accommodate changes in the received signal…") for controlling the multilevel quantizer (Jones: col. 6, lines 20-38) to quantize the equalized signal by the single predetermined threshold or the plurality of multiple predetermined thresholds (Jones: col. 6, lines 8-12). Therefore it would have been obvious to one of ordinary skill at the time of the invention to modify Jones with the teaching of

Jayaraman such as to reduce linear distortion over a variety of operating conditions (Jayarama col. 1 line 55-60) in the analogous art of equalization.

7. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones USPN 6873279 in view of Jayaraman USPN 7046726 as applied to claim 5 above, and further in view of Kuo USPN 7145968.**

8. **As per claim 6**, Jones in view of Jayaraman teaches the limitations as discussed above. Jones in view of Jayaraman do not teach the control logic which controls the multilevel quantizer according to an error decision, the error decision comprises: comparing the equalized signal with a predetermined level for a difference; controlling the multilevel quantizer to quantize the equalized signal by the single predetermined threshold in the case that the difference is less than a predetermined threshold; and controlling the multilevel quantizer to quantize the equalized signal by the plurality of multiple predetermined thresholds in the case that the difference is larger than a predetermined threshold.

Kuo teaches the control logic which controls the multilevel quantizer according to an error decision, the error decision comprises: comparing the equalized signal with a predetermined level (Kuo does not explicitly state that the threshold used in the

invention cannot be a predetermined level therefore it is obvious to one of ordinary skill in the art at the time the invention was made that the disclosed threshold can be a predetermined level) for a difference (fig. 4: 402: col. 4, lines 40-48: the claimed difference is the difference of the disclosed digital signal and the disclosed threshold); controlling the multilevel quantizer to quantize the equalized signal by the single predetermined threshold in the case that the difference is less than a predetermined threshold (fig. 4: 402: 402: col. 4, lines 40-48: Note that in this case only one threshold value is used); and controlling the multilevel quantizer to quantize the equalized signal by the plurality of multiple predetermined thresholds in the case that the difference is larger than a predetermined threshold (fig. 4: 402: 402: col. 4, lines 40-48: Note that in this case two threshold values are used).

Therefore it would be obvious to one of ordinary skill at the time that the invention was made to modify the teachings of Jones in view of Jayaraman with Kuo in order to shorten the amount of time consumed for mending errors caused by continuous decoding operations in a Viterbi decoder.

9. **Claim 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones USPN 6873279 in view of Jayaraman USPN 7046726 as applied to claim 1 above, and further in view of Strolle USPN 5799037.**

10. **As per claim 3**, Jones in view of Jayaraman teaches the limitations as discussed above. Jones and Jayaraman do not teach a derotator coupled between the passband adaptive equalizer and the multilevel quantizer; and a rotator coupled between the multilevel quantizer and the passband adaptive equalizer.

Strolle teaches a derotator (Strolle fig. 7: 903) coupled between the passband (Strolle: "equalization technique is performed upon a passband signal…" col. 3, lines 35-39) adaptive equalizer (Strolle fig. 7: 900) and the multilevel quantizer (Strolle fig. 7: 905; "quantizer 905 which performs quantization in the octant mode…" therefore the quantizer has eight multiple levels and is a multilevel quantizer. col. 14, lines 16 to 19) for derotating the equalized signal (Strolle; output of 900) and inputting the derotated equalized signal into the multilevel quantizer (Strolle; input of 905); and a rotator (Strolle fig. 7: 916 and 918) coupled between the multilevel quantizer (Strolle fig. 7: 905) and the passband (Strolle: "equalization technique is performed upon a passband signal…" col. 3, lines 35-39) adaptive equalizer (Strolle fig. 7: 900) for rotating the sliced signal outputted from the multilevel quantizer (Strolle fig. 7: 905) and inputting the rotated sliced signal into the passband adaptive equalizer (Strolle fig. 7: 902). See Strolle fig. 7; both rotators perform their function on the signal outputted from the multilevel quantizer (905) and the signals outputted from the rotators lead to the input of the adaptive equalizer (900); therefore the

rotators are coupled between the multilevel quantizer and the equalizer.

Jones in view of Jayaraman does not teach rotator and derotator elements. Strolle teaches rotator and derotator elements. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jones in view of Jayaraman with the teaching of Strolle since Strolle teaches the beneficial use of rotator and derotator elements such as create a receiver that demodulates a plurality of signal formats using common circuitry (Strolle: col. 1, lines 50-53) in the analogous art of equalization.

11. **As per claim 11**, Jones in view of Jayaraman teaches the limitations as discussed above. Jones in view of Jayaraman does not teach the device in claim 1 wherein the sliced signal output by the multilevel quantizer has a plurality of bits.

Strolle teaches the multilevel quantizer (Strolle fig. 7: 905; "quantizer 905 which performs quantization in the octant mode..." therefore the quantizer has eight multiple levels and is a multilevel quantizer, col. 14, lines 16 to 19).

Jones and Jayaraman do not teach the device in claim 1 wherein the sliced signal output by the multilevel quantizer has a plurality of bits. Strolle teaches the multilevel quantizer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jones in view of Jayaraman with the teaching of Strolle since Strolle teaches the beneficial use of

multilevel quantizer elements such as create a receiver that demodulates a plurality of signal formats using common circuitry (Strolle: col. 1, lines 50-53) in the analogous art of equalization.

12. **Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones USPN 6873279 in view of Jayaraman USPN 7046726 and Strolle USPN 5799037 as applied to claim 3 above, and further in view of Tazebay USPN 6680971.**

13. **As per claim 4,** Tazebay teaches a rotator (Tazebay fig. 2: 212) coupled with the FBE (Tazebay fig. 2: 218) for rotating the equalized signal (Tazebay fig. 2: output of 202), and the rotated sliced signal (Tazebay fig. 2: output of 208) a passband signal (Tazebay ABSTRACT: "The adaptive equalizer is a passband equalizer," therefore the signal in the applicant's claim is a passband signal). The output of the multilevel quantizer (Tazebay fig.2: 208) feeds into the input of the rotator (Tazebay fig.2: 212) and the rotator's output feeds into the FBE (Tazebay fig. 2: 218); therefore the rotator is coupled with the FBE for rotation the equalized signal.

Jones teaches FFE or FBE, a passband adaptive equalizer and a multilevel quantizer. Jayaraman teaches FFE and FBE. Strolle teaches a derotator coupled between the passband adaptive equalizer and the multilevel quantizer, and a rotator coupled between the multilevel quantizer and the passband adaptive equalizer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of

the invention to modify the invention and concepts disclosed in Jones, Jayaraman, and Strolle, with the teaching of Tazebay in order to improve the speed at which a passband equalization circuit reestablishes equalization (Tazebay col. 1, lines 60-64) in the analogous art of equalization.

Allowable Subject Matter

14. Claims 7-10 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Perez whose telephone number is (571) 270-3231. The examiner can normally be reached on Monday - Friday, 7:30am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on (571) 272-5026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP
4/19/07

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